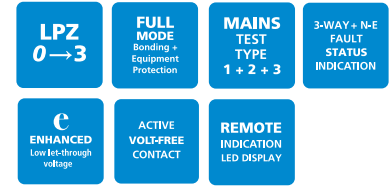


## DATASHEET

# Mains power protection ESP M1R, M2R & M4R Series

Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on mains power distribution systems primarily to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. computer, communications or control equipment. Remote display allows both display and protector unit to be mounted in their optimum positions. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location, with multiple metallic services entering) through to LPZ 3 to protect sensitive electronic equipment.



### Features & benefits

- The remote display means the protector can be mounted close to the incoming feed or first way on the distribution board and the display in an easily visible position, e.g. on front of cabinet
- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all sets of conductors (phase to neutral, phase to earth, neutral to earth - Full Mode protection)
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Innovative multiple thermal disconnect technology for safe disconnection from abnormal or faulty supplies
- Remote display gives three way visual indication of protection status
- Plug-in cable connections between protector and display enable easy connection (1 m cable supplied as standard)
- Advanced pre-failure warning so you need never be unprotected
- Remote indication facility allows pre-failure warning to be linked to a building management system, buzzer or light
- Changeover active volt-free contact enables the protector to be used to warn of phase loss (i.e. power failure, blown fuses, etc)
- Unique flashing warning of potentially fatal neutral to earth supply faults (caused by incorrect earthing, wiring errors or unbalanced conditions)
- Robust steel housing (protector), and sturdy ABS housing (display)
- Base provides ultra-low inductance earth bond to metal panels
- Remote display comes with integral fixings and a panel drilling template

### Application

ESP M1R: main distribution board for buildings with multiple metallic services (e.g. gas, water, telecoms) and sub-distribution boards feeding sensitive equipment. ESP M2R: main distribution board for buildings with Class III or IV LPS fitted or exposed 3-ph power lines where no LPS is fitted. ESP M4R: main distribution board for buildings with a Class I or II LPS.

### Installation

Installation of the protector unit is identical to the ESP M1, M2 or M4. Position remote display, making sure that the cable is long enough, is unimpeded within the cabinet, and allows a minimum of 60 mm behind the panel front (for the interconnection cable). For TT installations, contact Furse.

### Accessories

#### ESP RLA-1

Order code: 7TCA085460R0153

Spare 1 metre cable assembly

#### ESP RLA-2

Order code: 7TCA085460R0154

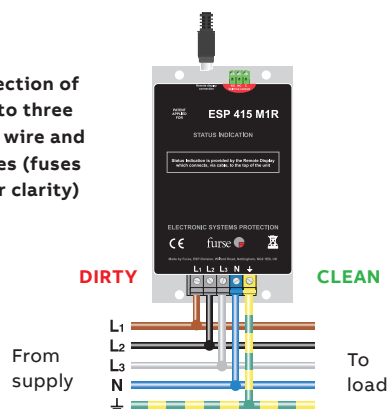
Spare 2 metre cable assembly

#### ESP RLA-4

Order code: 7TCA085460R0155

Spare 4 metre cable assembly

Parallel connection of ESP 415 M1R to three phase star (4 wire and earth) supplies (fuses not shown for clarity)



Simple plug and socket connection between the protector unit and the remote display

**NOTE:** For three phase applications where a remote display is unnecessary, use the respective ESP M1, M2 or M4 Series.

**ESP M1R, M2R & M4R Series - Technical specification**

Electrical specification	ESP 415 M1R	ESP 480 M1R	ESP 415 M2R	ESP 480 M2R	ESP 415 M4R	ESP 480 M4R
<b>ABB order code</b>	7TCA085460R0115	7TCA085460R0137	7TCA085460R0123	7TCA085460R0078	7TCA085460R0126	7TCA085460R0340
Nominal voltage - Phase-Neutral $U_o$ (RMS)	240 V	277 V	240 V	277 V	240 V	277 V
Maximum voltage - Phase-Neutral $U_c$ (RMS)	280 V	350 V	280 V	350 V	280 V	350 V
Temporary Overvoltage TOV $UT^{(1)}$	350 V	402 V	350 V	402 V	350 V	402 V
Short circuit withstand capability	25 kA/50 Hz					
Working voltage (RMS)	346-484 V	402-600 V	346-484 V	402-600 V	346-484 V	402-600 V
Frequency range	47-63 Hz					
Max. back-up fuse (see installation instructions)	≤ 125 A	≤ 125 A	≤ 200 A	≤ 200 A	≤ 315 A	≤ 315 A
Leakage current (to earth)	< 250 μA					
Indicator circuit current	< 5 mA	< 10 mA	< 5 mA	< 10 mA	< 5 mA	< 10 mA
Volt free contact: <sup>(2)</sup>	Screw terminal					
- Current rating	1 A					
- Nominal voltage (RMS)	250 V					
Transient specification	ESP 415 M1R	ESP 480 M1R	ESP 415 M2R	ESP 480 M2R	ESP 415 M4R	ESP 480 M4R
<b>Type 1 (BS EN/EN), Class I (IEC)</b>						
Nominal discharge current 8/20 μs (per mode) $I_n$	20 kA	20 kA	20 kA	20 kA	25 kA	25 kA
Let-through voltage $U_p$ at $I_n$	< 1.3 kV	< 1.4 kV	< 1.3 kV	< 1.4 kV	< 1.3 kV	< 1.4 kV
Impulse discharge current 10/350 μs $I_{imp}$ (to earth) <sup>(4)</sup>	6.25 kA	6.25 kA	12.5 kA	12.5 kA	25 kA	25 kA
Total discharge current 10/350 μs $I_{total}$ (total to earth) <sup>(4,5)</sup>	25 kA	25 kA	50 kA	50 kA	100 kA	100 kA
<b>Type 2 (BS EN/EN), Class II (IEC)</b>						
Nominal discharge current 8/20 μs (per mode) $I_n$	20 kA	20 kA	20 kA	20 kA	25 kA	25 kA
Let-through voltage $U_p$ at $I_n$ <sup>(3)</sup>	< 1.3 kV	< 1.4 kV	< 1.3 kV	< 1.4 kV	< 1.3 kV	< 1.4 kV
Maximum discharge current $I_{max}$ (L/N-PE, L-N) <sup>(4)</sup>	40 kA, 40 kA	40 kA, 40 kA	80 kA, 40 kA	80 kA, 40 kA	150 kA, 40 kA	150 kA, 40 kA
<b>Type 3 (BS EN/EN), Class III (IEC)</b>						
Let-through voltage at $U_{oc}$ of 6 kV 1.2/50 μs and $I_{sc}$ of 3 kA 8/20 μs (per mode) <sup>(3,6)</sup>	< 600 V	< 680 V	< 600 V	< 680 V	< 600 V	< 680 V
Mechanical specification	ESP 415 M1R	ESP 480 M1R	ESP 415 M2R	ESP 480 M2R	ESP 415 M4R	ESP 480 M4R
Temperature range	-40 to +80 °C					
Connection type	Screw terminal - maximum torque 2.65 Nm					
Conductor size (stranded)	25 mm <sup>2</sup>					
Earth connection	Screw terminal - maximum torque 2.65 Nm					
Volt free contact	Connect via screw terminal with conductor up to 2.5 mm <sup>2</sup> (stranded) - maximum torque 0.25 Nm					
Degree of protection (IEC 60529)	IP20					
Display connection	6 way 1 metre interconnection cable - 2 or 4 metre cable optional					
Case material	Unit - Steel, Display - FR Polymer UL-94 V0					
Weight: - Unit	1.0 kg	1.0 kg	2.35 kg	2.35 kg	3.9 kg	3.9 kg
- Packaged	1.1 kg	1.1 kg	2.5 kg	2.5 kg	4.2 kg	4.2 kg
Dimensions	See diagrams below					

- <sup>(1)</sup> Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to BS EN/EN/IEC 61643
- <sup>(2)</sup> Minimum permissible load is 5 V DC, 10 mA to ensure reliable operation. Under fault conditions, the remote display will go blank if the L1 phase loses power or becomes faulty. This is due to the isolation requirements needed for circuitry mounted externally to the main protector unit
- <sup>(3)</sup> The maximum transient voltage let-through of the protector throughout the test (±10%), phase to neutral, phase to earth and neutral to earth
- <sup>(4)</sup> The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation
- <sup>(5)</sup> Rating is considered as the current capability of the protector for equipotential bonding near the service entrance
- <sup>(6)</sup> Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in

